

CURRICULUM VITAE

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CURRENT POSITION

August 2021 – Present **Physical Scientist**
Great Lakes Environmental Research Laboratory (GLERL)
Integrated Physical and Ecological Modeling and Forecasting (IPEMF)
Ann Arbor, MI

EDUCATION

April 2003 **Master of Science in Meteorology**
Florida State University
Tallahassee, FL

April 2000 **Bachelor of Science in Meteorology**
Florida State University
Tallahassee, FL

PROFESSIONAL EXPERIENCE

August 2021 – Present **Physical Scientist**
Great Lakes Environmental Research Laboratory (GLERL)
Integrated Physical and Ecological Modeling and Forecasting (IPEMF)
Ann Arbor, MI

Summary:

- The mission on the Great Lakes Environmental Research Laboratory is to conduct scientific research on the Great Lakes and coastal ecosystems; develop and transition products and services; and share knowledge and information to advance science, service and stewardship.
- GLERL's Integrated Physical and Ecological Modeling and Forecasting (IPEMF) branch develops, evaluates, and applies models for use in testing scientific hypotheses and predicting the effects of natural and human-generated changes on the Great Lakes environment.
- IPEMF conducts innovative research and develops numerical models to predict the physical, chemical, biological, and ecological response in the Great Lakes due to weather, climate, and human-induced changes. The forecast models and quantitative tools developed by IPEMF researchers allow scientists, coastal resource managers, policy makers, and the public to make informed decisions for optimal management of the Great Lakes and to maintain a healthy, sustainable, resilient ecosystem.

June 2018 –
August 2021

Science and Operations Officer (SOO)
National Oceanic & Atmospheric Administration
National Weather Service
Weather Forecast Office
Tampa Bay Area, FL

Summary:

- This position is deemed essential by the United States government. This position is both operational and management as it entails both overseeing and working critical forecast and warning services within an operational meteorology environment at a National Weather Service Weather Forecast Office.
- Duties include: Oversee the quality and delivery of meteorological warnings, forecasts and decision support services to core partners, the public and specific industries.
- Leading or collaborating with the atmospheric science research community on hydrometeorological research and development opportunities to identify and implement new forecast techniques.
- Evaluate and improve the technical accuracy and scientific integrity of hydrometeorological products to support national and local forecasting efforts.
- Conduct evaluations of the effectiveness of various observational systems to maximize local application.
- Highly experienced in array of meteorological forecasting and warning facets, including Aviation, Marine, Fire Weather, Tropical, Winter Weather, Hydrology, Doppler Radar, Satellite, and specialized client application services.

March 2012 –
May 2018

Senior/Lead Forecaster
National Oceanic & Atmospheric Administration
National Weather Service
Weather Forecast Office
Tampa Bay Area, FL

Summary:

- The position is deemed essential by the United States government, as it entails shift supervision and critical forecast and warning services within an operational meteorology environment at a National Weather Service Weather Forecast Office.
- Serve as the shift leader responsible for quality and timeliness of all NWS forecast and service products, warnings, and advisories prepared and issued by the Weather Forecast Office (WFO).
- Conduct a weather watch which involves interpretation of Doppler radar data, satellite imagery, and the analysis of other hydrometeorological data for the preparation of all WFO warning, forecast and service products, including individual briefings.
- Serve as the primary contact with other Federal, state, and local agencies such as Federal Aviation Administration (FAA), Federal Emergency Management Agency (FEMA), and emergency management and law enforcement officials over matters involving the initiation and implementation of immediate or emergency public health and safety measures based on NWS forecasts, warnings and watches.
- Handle general office administrative matters which may occur on shift including augmenting staff, and approving overtime and leave.

May 2006 –
March 2012

General Forecaster
National Oceanic & Atmospheric Administration
National Weather Service
Weather Forecast Office
Tallahassee, FL

Summary:

- The position is deemed essential by the United States government, as it entails critical operational meteorology and warning services at a National Weather Service Weather Forecast Office.
- Integrate, with occasional assistance, forecast weather, water, and climate hazards with associated societal risks to produce and communicate life-saving impact-based warnings, advisories, outlooks and general forecasts, providing initial review of data to ensure accuracy, precision, and timeliness.
- Support the development, production and delivery of interpretive services by providing, with occasional assistance, most Impact Based Decision Support Services (IDSS) that include tailored products, specialized notifications, remote briefings, and/or on-site deployments to a set of core partners that share a role in public safety and protection of property.
- Collect, assess, analyze, and integrate a complete set of meteorological, hydrological, and climatic data in order to provide forecasts of critical elements at global, synoptic, and increasingly finer meso-scale levels.
- Apply expertise, with occasional assistance, in the theory of weather, water and climate sciences including providing current knowledge of scientific and technological developments and delivering science-based and technology-based solutions to operational challenges.
- Assist in the collaboration and co-creation with colleagues while leveraging the talents of others to improve and optimize the day-to-day operational functions of Weather Forecast Offices.
- Designed and taught college level sessions from the National Weather Service Operational Meteorology Course (MET 4750) at Florida State University 2010 and 2011.

June 2004 –
May 2006

Intern Forecaster
National Oceanic & Atmospheric Administration
National Weather Service
Weather Forecast Office
Marquette, MI

Summary:

- This is an entry level position. The position is deemed essential by the United States government, as it entails critical operational meteorology and warning services at a National Weather Service Weather Forecast Office.
- Duties include: Significant levels of official training in hydrometeorological analysis, forecasting, radar meteorology, warning services, decision support services, communication, data quality control, satellite meteorology and hydrology,
- Integrate, with assistance, forecast weather, water, and climate hazards with associated societal risks to produce and communicate life-saving impact-based warnings, advisories, outlooks and general forecasts, providing initial review of data to ensure accuracy, precision, and timeliness.

- Support the development, production and delivery of interpretive services by providing, with assistance, most Impact Based Decision Support Services (IDSS) that include tailored products, specialized notifications, remote briefings, and/or on-site deployments to a set of core partners that share a role in public safety and protection of property.
- Collect, assess, analyze, and integrate a complete set of meteorological, hydrological, and climatic data in order to provide forecasts of critical elements at global, synoptic, and increasingly finer meso-scale levels.
- Develop expertise, with assistance, in the theory of weather, water and climate sciences including providing current knowledge of scientific and technological developments and delivering science-based and technology-based solutions to operational challenges.
- Assist in the collaboration and co-creation with colleagues while leveraging the talents of others to improve and optimize the day-to-day operational functions of weather forecast offices.

January 2003 – **Operational Staff Meteorologist**
 May 2004 Meteorologix/DTN, LLC
 Boston, MA

Summary:

- The main duty associated with this position was the creation of an hourly five-day forecast database for approximately 50 U.S. and Canadian cities. Specific forecasts were developed from this database for electric and natural gas utility clients.
- Prepared forecasts and participated in conference calls for a variety of major national utility clients including and not limited to the Tennessee Valley Authority (TVA), Commonwealth Edison (Chicago), Pennsylvania-Jersey-Maryland Interconnection (PJM), ISO New York/New England, Carolina Power and Light, Southern Company, and Duke Energy.
- Prepared tailored forecast and participated in conference calls for numerous township and city clients, departments of public works, and airports.
- Prepared tailored forecasts and participated in conference calls for Major League Baseball, specifically the Boston Red Sox and Cincinnati Reds organizations.

August 2000 – **Graduate Research Assistant**
 May 2003 Florida State University
 Tallahassee, FL

COMPUTER SKILLS

- Linux based computer systems (Red Hat/CentOS) / Windows OS.
- NOAA Weather and Environmental Toolkit
- Advanced Weather Interactive Processing System (AWIPS) – Installed and fully functional on personal linux computer systems
- Unidata - Integrated Data Viewer (IDV)

- Programming Languages: Python / Bash / C / Javascript / Fortran / GrADS / HTML5
- Geographic Information Systems (GIS): ArcMap / ArcGis Desktop / ArcGIS Online
 - **Coursera – University of Toronto**
 - GIS Course Certificate: Introduction to GIS Mapping
 - GIS Course Certificate: GIS Data Acquisition and Map Design
 - GIS Course Certificate: Spatial Analysis & Satellite Imagery in a GIS

INTERDISCIPLINARY COLLABORATIONS

- NWS Severe Weather Operations Team (2020-2021). Charged with reviewing, updating, and optimizing the NWS severe weather programs and operations.
- NWS Southern Region representative for GHWO standardization effort.
- National Model Evaluation Team (2020) that quality controlled and verified the new High-Resolution Ensemble Forecast System Version 3 (HREF-V3).
- National Blend of Models (NBM) Science Advisory Group. Charged with identifying, ranking, and implementation of upgrades to the NBM based on NWS operational needs.
- NWS Southern Region representative for the National Graphical Hazardous Weather Outlook standardization project.
- NWS Tampa Bay Area Decision Support Services Team.
- NWS Tampa Bay Area Computer and Software Development Team.
- NWS Southern Region Simulating Waves Nearshore (SWAN) Numerical Optimization and Sensitivity Evaluation Project. Results presented at the 92nd AMS Annual Meeting - 2012.

LEADERSHIP TRAINING

- 2019 **Science and Operations Officer Development Course.** Kansas City, MO.
- 2018 **Southern Region Building Leaders for a Solid Tomorrow (BLAST) Residency Course.** San Antonio, TX
- 2015 **Field Operations Management Course.** Kansas City, MO.
- 2012 Multi-agency collaboration with emergency management partners and designed innovative services to support the Republican National Convention. Tampa, FL.
- Online Leadership Courses:** Communicating As a Leader, Dynamics of Leadership, The Emotionally Intelligent Leader, Increasing Your Emotional Intelligence, Emotional Intelligence in the Workplace Simulation, Interpersonal Skills on the Fast Track, Diversity on the Job: Diversity and You, Diversity on the Job: The Importance of Diversity and the Changing Workplace, Diversity: the Future.
- Leadership books:** 7 Habits of Highly Effective People, Wooden, QBQ - The Question Behind the Question (BLAST recommended reading).

OPERATIONS AND DECISION SUPPORT

- NWS Southern Region deployment certified for on-site decision support services.
- Completion of all seven units in the NWS Impact-Based Decision Support Services (IDSS) Professional Development Series.
- Onsite emergency management decision support services for numerous large events in west-central Florida including Gasparilla Celebration/Parade in Tampa, FL and Sun N Fun Airshow.
- Prepared and delivered numerous decision support webinars to emergency management for high impact weather events including tropical cyclones, severe weather, wildfires, State of Florida controlled-burn activities, ecological chemical spills, and cold air outbreaks.
- Designed and prepared several complex weather simulations for various operational exercises with Port Tampa and the United States Coast Guard.
- Development of a comprehensive coastal flood monitor situational awareness website to access the coastal inundation threat and produce tables, graphs, and decision aids in a variety of frequently used datums (MHHW, MLLW, MSL, NAVD88, AGL).
- AWIPS derived parameter development of forecast methodology related to prediction of meteo-tsunami events along the Gulf of Mexico coast.
- WarnGen AWIPS configuration.
- Worked with NOS representatives to establish a methodology of data delivery from the Tampa Bay Operational Forecast System model into AWIPS.
- Designed, scripted, and maintained Graphical Forecast Editor (GFE) grid population procedures, allowing for rapid first guess forecast grid population.
- Co-led integration of the Nearshore Waves Prediction System at WFO TBW, including set-up of nested high resolution “rip-current” domain.
- Set up GFE satellite visibility and ceiling probabilities during the GOES-R deployment phase.
- Worked with WFO Minneapolis to produce inland lake wave model forecasts, and incorporate new snow ratio methodologies into operations to satisfy emergency management request.
- Created training material for SHERB (Severe Hazards in Environments with Reduced Buoyancy) convection parameter to WFO operational staff.
- Presented to local media partners, subjects related to numerical weather prediction, and its evolution in conjunction with the 20th anniversary of the 1993 Superstorm.
- Created automated forecast graphics used in weekly webinars, to aid in various decision support services, such as temperature sensitive marine life and harmful algal blooms.
- Developed annual warm season rainfall climatologies for Lake Panasoffkee, FL basin, to support information request from local officials.

TECHNOLOGY INFUSION

- Co-Lead with faculty at Embry-Riddle Aeronautical University on COMET lightning research into identifying “first strike” temporal probability scales, and also experimental model based short term lightning hazard forecasts.
- Member of team that developed the operational Tampa Bay Marine Channels Forecast. The Marine Channels Forecast is a route-following graphical display along the shipping channel

through Tampa Bay used by the Tampa Bay navigational pilots. Multi-organizational undertaking between the National Weather Service (NWS) and the National Ocean Service (NOS). This proof-of-concept undertaking represents a significant evolution of services, by combining forecast and dissemination efforts across NOAA agencies.

- Developed python-based software package to spatially and temporally convert Level 3 radar data from any WSR-88D site to another. This software allows any Warning Event Simulation event across the country to be mapped to a forecaster's familiar county warning areas. The benefit to decision support services is large, as the number and types of events that can be practiced in any one location increases substantially.
- Authored graphics creation package utilizing python methods to create decision support and social media quality graphics from the local forecast database.
- Wrote code for the Graphical Forecast Editor (GFE) to calculate Quantitative Precipitation Estimate forecasts by means of the probability matching methodology.
- Developed a series of plotting scripts and associated internal website to pull Extra-tropical storm surge datasets out of AWIPS and create a decision support platform for determining water level threats at various locations along the Florida west coast.
- Authored interactive website to aid forecasters with step-by-step instructions through the complex process of forecast operations during threats from tropical cyclones and accompanied advisories from the National Hurricane Center.
- Researched and developed high resolution spatial and temporal thunderstorm climatology frequency datasets related to sea-breeze convection in the southeast United States spanning the years 2002 through 2019. Authored a sharable package of tools/datasets for this project that can be easily ingested into AWIPS for use by other NWS offices across the southeastern United States.
- Development of experimental GFE ensemble visibility hazard grids for marine and aviation decision support services in support of products and services related to the Environmental Services Pilot Project at WFO Tampa Bay.
- Implemented and led a project with the state of Florida WFOs and representatives from the National Severe Storms Laboratory to deliver a subdomain of data from their WRF ARW numerical weather prediction model via FTP.
- Member of multi-office team which developed real-time Ensemble Convection Allowing Model (ECAM) neighborhood probability datasets within the Graphical Forecast Editor (GFE). Poster presentation - 2013 National Weather Association conference.
- Developed capability, configured AWIPS, and authored derived parameters for display of all 21 members of the 0.5° Global Ensemble Forecast System.
- Set-up and maintenance of non-baseline datasets into AWIPS and AWIPS II to enhance operational capability related to forecasts and decision support services.
- Develop and installed numerous AWIPS derived Parameters to enhance operational situational awareness, and incorporate additional science into the forecast process.
- Weather Research & Forecasting (WRF) Advanced Research (ARW) office program leader.

- Authored “AviationPlotter” software package for production of color coded time-series plots of forecast parameters from model databases at airport terminals.
- Presentation to visiting representatives from regional and national headquarters regarding recent technological and scientific innovations at the local WFO.
- Work with ITO on local implementation of the national NIC smartinit project.
- Designed program for Energy Release Component ingest into AWIPS for fire weather core partners. Smart tool adapted by Florida NWS offices.

PUBLICATIONS & CONFERENCE PRESENTATIONS

- Austin, M., **Mroczka, B.**, Jillson, E., Baron, T., Urizar, C. (2017). Leveraging Innovation through Collaboration: Enhancing Impact-Based Decision Support Services for Marine Interests in and Around Tampa Bay, Florida. 97th AMS Annual Meeting, Seattle, WA, January 22-26, 2017.
- Paxton, C., **Mroczka, B.**, McKaughan, A., Kryston, C., (2017). Southwest Florida Warm Season Waterspouts. 97th AMS Annual Meeting, Seattle, WA, January 22-26, 2017.
- **Mroczka, B.**, Lericos, T., Fournier, J., (2011). The Use of High Resolution Models in Forecasting the Deep South Ice Storm of January 10th, 2011. Submission to the 2011 NWA Conference, 15-20 October 2011, Birmingham, AL.
- Fournier, J., **Mroczka, B.**, Lericos, T. (2011). A Comparison of Statistical Versus Explicit Convection Model Precipitation Forecasts During the Summer Convective Season in Tallahassee, FL. Submission 2011 NWA Conference, 15-20 October 2011, Birmingham, AL.
- **Mroczka, B.** (2010). Conference Poster Session: Improving the temporal and spatial resolution of the forecast of sea-breeze generated convection along the southeast U.S. coast. Southeastern Coastal Atmospheric Processes Symposium (SeCAPS), March 2010, Mobile, AL.
- **Mroczka, B.A.**, Camp, J.P., Gould, K.J., Watson, A.I. (2010). Improving the temporal and spatial resolution of the forecast of sea-breeze generated convection along the southeast U.S. coast. 90th AMS Annual Meeting, Atlanta, GA, January 18-22, 2010. [Available online <http://ams.confex.com/ams/pdfpapers/161602.pdf>]
- Watson, A.I., **Mroczka, B.A.**, Fournier, J.A., Camp, J.P., Goree, R.C. (2008). The tornado outbreak of 1-2 March 2007 in the National Weather Service Tallahassee Forecast Area. 88th AMS Annual Meeting, New Orleans, LA, January 20-24, 2008. [Available online <http://ams.confex.com/ams/pdfpapers/134352.pdf>]
- Fuelberg, H.E., Quina, G.S., **Mroczka, B.A.**, Lanier, R.J., Bradberry, J.S. and Breidenbach, J.P. (2002). A high resolution precipitation database for Florida. Reprints, Second Federal Interagency Hydrologic Modeling Conference, Las Vegas, NV.
- Fuelberg, H.E., Quina, G.S., **Mroczka, B.A.**, Lanier, R.J., Bradberry, J. and Breidenbach, J.P. (2001). High resolution precipitation climatologies from radar data. Eighteenth Conf. Wea. Analysis and Forecasting, Amer. Meteor. Soc, Ft. Lauderdale.

AWARDS AND RECOGNITION

- 2015 **NOAA Bronze Medal Award:** Team from NWS Tampa Bay Area and NOAA National Ocean Service (NOS). *"For implementing environmental and ecological services targeted to improve human health, promote safe marine navigation, and build coastal resiliency".*
- 2013 **Southern Region Director's Award:** Teamwork and Operational Service Improvement Efforts.
- 2011 **Southern Region Director's Award:** Teamwork and Operational Service Improvement Efforts.
- 2009 **Southern Region Director's Award:** Teamwork and Operational Service Improvement Efforts.